

BCDA Activities – June 04

Specific beamline/XOR support

XOR-1ID:

- Upgraded ioc1idc to synApps_4_5. Configured and tested pseudo motors based on transform records and soft motors.

XOR - Sector 2

- Made a quick fix of scanSee.R3.2 for Dan Legnini from 2ide such that changing of detector selection during real-time scanning will not break out of real-time mode.
- Assisted Barry Lai from 2idd how to get 1D array for a 2D scan which consists of scanH record. I am going to add a new feature of easy and flexible access 1D data array directly from scanSee main window.
- Tomography
 - Enhanced the debug information exported by the cluster to aide in debugging system problems.
 - Found and fixed a memory overrun problem that's been plaguing us for a while now. The problem was very intermittent and only showed up during the interplay of two separate threads but resulted in occasional, random incorrectly reconstructed slices.
 - Encountered a problem where the java script that controls the data acquisition suddenly started to fail frequently. At first, the process would only occasionally fail, but, over the course of 12 hours, it began failing more and more regularly. Not sure what the root cause is, but the general problem appears to be that some of the PVs were not being connected properly and were timing out. Increasing the CA timeout seems to have temporarily fixed the problem.

XOR-2BM:

- Provided EPICS consultation to Andrei Tkachuk, who is writing support for a temperature controller.

XOR-3ID:

- Re-designed Wavelength Electronics temperature controller EPICS support. Enhanced performance and added 4-channel capability. Installed and tested in 3idc.
- Installed and tested software for the Brooks Mass Flow Controller in ioc3idb. Configured and demonstrated an EPICS PID-loop for control of the flow valve based on a process temperature.

MU-CAT – Sector 6

- Worked with Philip Ryan in sector 6 to help troubleshoot a CCD camera hardware problem.

MHATT – Sector 7

- It was determined that an apparent bus error problem with an OMS VME58 board at MHATT-CAT was caused by a brand new Tracewell System 22 Type 1 VME Chassis power supply. I have not been able to find a VME power supply test procedure that would allow me to definitively identify the power supply as the root cause of these, intermittent, VME bus failures. This is unfortunate for at least two reasons. First, there is another IOC (ioc2ida) that has exhibited very similar symptoms; i.e., intermittent bus errors on known, good, hardware. Second, since the symptoms are intermittent and misleading, this problem can eat up a lot of time before you finally determine that the root cause is the power supply. One final note, I was unable to recreate these intermittent bus errors with the defective Tracewell chassis in my office until Dohn Arms (MHATT-CAT) suggested I move the OMS VME58 board to the extreme right hand VME slot. With the defective power supply, I observed a positive correlation between failure frequency and the number of slots between the SBC and the VME58 boards.

IMMY – Sector 8

- Co-hosted (w/A. Sandy) a visit to Sector 8 to review the SPEC to EPICS work done there. R. Klaffky and G. Long attended.
- Worked with A. Sandy to design a consistent online help access from the beamline schematic screens. A prototype for the I-Station is complete and Alec is working on the underlying help content.
- Upgraded sector 8 copies of Image Server software.
- I Station
 - Integrated the KEPCO BOP series of power supplies into EPICS. The BOP series communicates via RS232. Work included database and MEDM screen development. A BOP 20-10 power supply is now in use in the I-Station.
 - Completed work on the I-Station Beamline Schematic MEDM screen.
 - Installed support the a second XIA slit stage to allow for switching between the 2 & 4 blade XIA stages at the S3 position.
- MultiTau cluster

- Had multiple meetings with various sector 8 people to discuss the proposal for a parallel processing cluster to perform real time multitau calculations.
- Began converting mutlitau algorithm from Yoric to C for use in a parallel processing cluster.

MR-CAT – Sector 10

- Worked with David Ehle in sector 10 to get the Aerotech U500 controller functional with EPICS again. This is a system that used to be used in sector 2 for Lithography but has now been moved to sector 10.
- Helped David Ehle (MR-CAT) build synApps 5.0 under epics 3.14.6. (synApps 5.0 was written to work with epics 3.14.5.)

NanoCAT – Sector 26

- Attended discussions with the intent of developing a first draft specification proposal for the nanoprobe to be built in 26id. The specification includes mechanical and controls specifications that are required by the nanoprobe. In the near future, these meetings will be expanded to the larger group.
- Received and started evaluating the P7000 drives from Pacific Scientific. These motor drivers/controllers have a lot of nice features including automatic stall detection which make them a very attractive drive at a very competitive price.

XOR

- Assisted Joe Maj in exporting hdfb image data to other presentation software.

General

Updated BCDA custom hardware web pages. Converted top level page to standard format and made it W3C compliant.

Designed a new OMS VME58 transition board, optimized for low cost and complexity. Received prototype printed circuit boards and tested successfully.

Hardware Database Interface

- Continue work of editing of the Control's Hardware EDIT/CREATE web application to support Beamline Interest and Contact Person (COG) fields.

Group Laptop

- Received the USB to RS232 converters and was able to test them a demo version of ProTerm. This system was able to connect to the 2 IOC debug ports at the same time.
- Plan on requesting the purchase of ProTerm for Mac OS X (\$70).

BCDA Knowledgebase

- Installed the Controls Group's logging and task management software for analysis and testing.

GATEWAY

- A complete new package of EPICS/IDL extensions tools has been built on the epicscat/gateway for solaris, Linux, and linux-x86. This package includes most current IDL visualization tools like catcher, scanSee, viewer, hdfb, etc. This package is available on all gateway machines.

Linux and solaris directories are built with EPICS baseR3.13.9
linux-x86 directory is built with EPICS base-3.14.5

IDL 6.1 BETA

- Participated IDL 6.1 Beta test and tested all the EPICS/extensions IDL tools. Reported to RSI the problems encountered in IIMAGE
- Prepared catcher1.sav, sscan.sav, hdfb1.sav, SB2_1.sav, viewer1.sav for IDL 6.1 Beta, verified that IDL ITOOLS can be accessed from the IDLVM 6.1 (not from IDLVM 6.0)

SCANSEE R3.3

- Worked on 1D PS script plot, such that by default it will support colored 1D PS plot instead of black and white with different line texture.
- Fixed the real-time problem encountered in 2D scan when a user changed the number of plot detectors during the middle of 2D scanning.
- Implemented 1D overlay program for scanSee. This new feature has been requested by Dan Legnini of Sector 2. The first attempted 1D overlay program is now implemented for scanSee. It allows the user freely to select a set of multiple MDA files from the working directory, then to extract the specified detector 1D vector from 1D data array found from the selected mda files, a scattering 1D plot of the extracted 1D vectors is generated for all 1D vectors.
- Implemented 1D calibration calculation for scanSee

HDF5 BROWSER

- Modified image2d.pro such that it will support list name exceeding 20 characters. Very often the dataset name extracted from HDF5 tree structure exceeds 20 characters, now image2d.pro can accept datasets extracted from a HDF5 file.
- A new IDL plot2d_image.pro is written and it is targeted for displaying real image data with known image palette.

It is able to display any image data with an associated image_palette,
It can flexibly flip the image vertically and horizontally,
It will automatically resize the image if the window is resized by the user, it
allows the user to export image as TIFF/PNG/PICT files,
It allows the user to dump the image to any post-script printer.

- A program called saveImage.pro has been created which can be called by any IDL program which intends to dump the IDL screen plot to TIFF/PNG/PICT files.
- Starting to implement IDL/HDF5 routines for extracting HDF5 dataset
- Continued device driver development for OMS's VME58 replacement; i.e., MAXv.
- Continued device driver development for Delta Tau's PMAC motor controller. Trying to get Delta Tau to recreate a "memory aliasing" problem I believe they have with their VME PMAC version.

Upgrades to CCD Image Server

- Helped sector 8 troubleshoot a problem they are having with data acquisition. It is unclear if the problem is hardware or software related.
- Added ability to save a few user defined PVs into the binary data files.
- Installed CCD Image Server software for use at 2ide.

Access Grid

- Met with Ivan Judson from MCS to discuss EPICS integration into the access grid. A plan to integrate 2BM as a test bed was discussed.
- Met with members of ASD Controls, Computing Support and BCDA to discuss a plan to implement the ACCESS grid in sector 2.
- Installed AG2.2 on my desktop machine and my laptop and played a little.
- Prepared a rack mount PC (mostly from spare parts) for use as an AG server machine to be placed at 2bm as a test installation of AG. Gave this machine to Ken Sidorowicz so he can start having the software installed.

eBrick

- Spent a little time trying to understand why the AsynRecord has such poor performance on my system.

Worked with Christoph Rau to help resolve some IDL usage issues so he could more effectively use IDL to analyze tomography data.

Helped provide technical expertise to a group of students Francesco DeCarlo is supervising.

Worked on LDRD proposal evaluation

Fixed bug in save_restore (calling ca_state() with null pointer)

Wrote detailed help displays for most sscan-record adl files

Helped Gaspar Pajor (Cosylab) get autosave running on his Linux system.